

### **REMARKS**

Claims 1-6 are pending. By this Amendment, Claims 1, 3-4 and 6 are amended. Applicants respectfully submit that support for the amendments is provided in the originally filed application, and as such, no new matter is presented herein.

### **Entry of Response Proper**

Entry of this Amendment is proper under 37 C.F.R. §1.116 since the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issues requiring further search and/or consideration on the part of the Examiner; (c) satisfy a requirement of form asserted in the previous Office Action; (d) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (e) place the application in better form for appeal, should an appeal be necessary. The Amendment is necessary and was not earlier presented because it is made in response to objections raised in the Final Rejection. Entry of the Amendment is thus respectfully requested.

### **Election By Original Presentation**

The August 22 Office Action asserts Claims 1-5 are directed to an invention that is independent or distinct from the invention originally claimed because compositions using molten metal are deemed patentably distinct from the foamable powders originally presented and to the extent that carbonate would exist in combination with molten metal, the carbonates would be in

substantially a different form than the carbonates as foamable powders set forth in the claims as originally presented.

Applicants acknowledge that the originally claimed foaming agent for manufacturing a foamed or porous metal is similar to a foaming agent that is mixed with molten metal as claimed. However, Applicants respectfully submit the claims as amended herein recite a condition wherein the foaming agent has started performing or has already performed a foaming reaction (or become gasified) from the heat of the molten metal. As such, Applicants respectfully submit the withdrawal of combination claims 1-5 should be withdrawn, claims 1-5 rejoined with method claim 6, and claims 1-6 examined on their merits.

#### **Specification**

The Specification is objected to for a supposed informality therein. Although Applicants respectfully disagree with the assertions made in the Office Action, Applicants have amended the Specification responsive to the objection. Applicants respectfully note that not only was a corresponding English language reference (i.e., U.S. Patent No. 5,151,246) of the Japanese reference submitted with the Information Disclosure Statement dated June 20, 2005, but that the electronic Image File Wrapper of the instant application on the Patent Office's own website contains an electronic version of the Japanese reference in question. Moreover, for the convenience of the Examiner, Applicants enclose herein a patent family from the EPO database showing the relationship between the references added to paragraph [0003]. Withdrawal of the objection is respectfully requested.

### **Claim Rejection – 35 U.S.C. §102**

Claim 6 is rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,401,568 to Hahn et al. (Hahn). Applicants respectfully traverse the rejection.

The Office Action asserts Hahn discloses calcium carbonate or magnesium carbonate particles coated with silica, i.e., SiO<sub>2</sub>. The feature of the material as a foaming agent is considered by the Office Action to be inherent in Hahn since the powders are otherwise indistinct from the claims and carbonates are well known to decompose at elevated temperatures to form carbon dioxide gas.

Applicants provide the following comments.

Claim 6 is amended herein to recite a method of manufacturing a foamed or porous metal, the method comprising preparing a foamable powder having a coating layer of SiO<sub>2</sub> covering particle surfaces of the foamable powder; adding the foamable powder as a foaming agent into a molten metal, wherein heat from the molten metal gasifies the foamable powder; and cooling the molten metal to yield the foamed or porous metal, wherein the foamed or porous metal includes a plurality of pores formed from gasification of the particles of the foamable powder.

While Applicants concede it is possible to use Hahn's product, that is, particle composition consisting of fine-grained white pigment of MgCO<sub>2</sub> wrapped with a layer of amorphous precipitated silicic acid, as a foaming agent, Applicants note that due to its small specific surface, Hahn's product would not create the

sufficient foaming reaction as is accomplished by the present invention. More specifically, Hahn requires a small specific surface of generally  $<100 \text{ m}^2/\text{g}$ , whereas it is desirable for foaming agents to have a large specific surface for the purpose of creating a foaming reaction with high foaming efficiencies. As a result of these opposing requirements, Applicants respectfully submit Hahn's product cannot be practically used as a foaming agent.

The present invention provides a foaming agent having a good wetting property with molten metal, such as aluminum, so as to ensure uniform distribution of the forming agent into the molten metal, which leads to the production of a foamed or porous metal with uniformly distributed pores, and which is formed from a foamable powder that does not contain any hydrogen radicals, which would otherwise involve the danger of a hydrogen induced explosion. To this end, the inventive foaming agent includes a coating layer of  $\text{SiO}_2$  covering the particle surfaces of a foamable powder so as to provide a good wetting property with a molten metal, and the foamable powder being a carbonate, such as  $\text{CaCO}_3$  and  $\text{MgCO}_3$ .

On the contrary, Hahn is directed to a particulate composition or material to be used as a filling material in a heat-sensitive layer of a heat-sensitive recording material. The particulate composition is used to prevent the adhesion of a molten dye-develop complex to a thermal print head (col. 1, lines 25-30). To this end, the particulate composition needs to have a high oil absorption rate of generally  $>100\text{ml}/10\text{g}$ , a high particle fineness with a mean secondary particle size of generally at least  $70\text{wt}\% < 4 \text{ }\mu\text{m}$ , a surface activity as small as possible,

and a small specific surface of generally  $<100 \text{ m}^2/\text{g}$  (col. 1, lines 31-43). To attain such requirements, Hahn's particulate composition includes fine-grained white pigments and an amorphous precipitated silicic acid that are bound together either by wrapping the fine-grained white pigments with a layer of amorphous precipitated silicic (claim 1) or through punctiform bonding (claim 14).

As such, Applicants respectfully submit that given the underlying objective, functions and effects achieved by the structural components of the final product, Hahn's product cannot be used in a manner recited by Claim 6.

As such, Applicants respectfully request withdrawal of the rejection.

### **Conclusion**

In view of the foregoing, reconsideration of the application, withdrawal of the outstanding objection and rejection, rejoinder of Claims 1-5, allowance of Claims 1-6, and the prompt issuance of a Notice of Allowability are respectfully solicited.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing docket number 101154-00014.**

Respectfully submitted,  
**ARENT FOX PLLC**

A handwritten signature in black ink, appearing to read 'Murat Ozgu', is positioned above the printed name.

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Enclosure: Patent Family Tree from EPO Database

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CMM:MO/elp

**Family list****13** family members for:**JP4231403**

Derived from 9 applications.

- 1 VERFAHREN ZUR HERSTELLUNG AUFSCHÄUMBARER METALLKÖRPER**  
Publication info: **AT142135T T** - 1996-09-15
- 2 METHODS FOR MANUFACTURING FOAMABLE METAL BODIES**  
Publication info: **CA2044120 A1** - 1991-12-09  
**CA2044120 C** - 2001-05-01
- 3 Porous metal body prodn. - involves compaction at low temp. followed by heating to near melting point of metal**  
Publication info: **DE4018360 C1** - 1991-05-29
- 4 METHODS FOR MANUFACTURING FOAMABLE METAL BODIES**  
Publication info: **DE4101630 A1** - 1991-12-12  
**DE4101630 C2** - 1992-04-16
- 5 Foamable metal body prodn. with reduced density differences - by charging hollow section with mixt. of powder contg. expanding agent and metal powder, and precompacting**  
Publication info: **DE4124591 C1** - 1993-02-11
- 6 Verfahren zur Herstellung aufschäumbarer Metallkörper**  
Publication info: **DE59108133D D1** - 1996-10-10
- 7 Process for making foamed metal bodies**  
Publication info: **EP0460392 A1** - 1991-12-11  
**EP0460392 B1** - 1996-09-04
- 8 PREPARATION OF FOAMABLE METAL BODY**  
Publication info: **JP2898437B2 B2** - 1999-06-02  
**JP4231403 A** - 1992-08-20
- 9 METHODS FOR MANUFACTURING FOAMABLE METAL BODIES**  
Publication info: **US5151246 A** - 1992-09-29

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